Blueprint for a DevOps CI-CD Automation as a Platform Product

How CSPs can develop one in conjunction with their IT vendor/partner

Abstract

Communications service providers (CSPs) have been struggling to build and maintain a bespoke CI-CD platform from scratch, mainly due to the technical complexity and the fragmented technologies involved. Furthermore, it entails a steep learning curve during the process of implementation. Creating a platform for the purpose so desired, places a lot of demand on time and resource availability. For these reasons, many organizations find it challenging to allocate core resources toward building such a platform.

As evidenced by DevOps reports and analyses carried out by various firms[1, 2] it is clear that high-level, elite teams tend to focus on their core competencies in order to deliver the products and value their customers expect, rather than spend time on contextual developments.

This white paper provides unique insights for CSPs to enable their IT vendors to create contextual capabilities such as DevOps CI-CD automation platforms. By leveraging their broad skillsets and experience, the executive management of telecom firms can direct their teams to deliver core competencies efficiently and effectively, building optimized products and services related to networks, OSS, BSS, VAS, and so on.

An idea evaluation matrix

CSPs have started to adopt agile and DevOps methods. However, they struggle to manage their platforms and capabilities, which are often a combination of on-premises infrastructure, public cloud environments and customer premises. It is extremely complex to maintain and manage CI-CD workflow to enable delivery of these applications, systems, assets, services, and networks.

Telecom firms recognize how important it is to minimize deployment friction, whilst decreasing lead time for delivery. If they can do this, while simultaneously providing new features and services without compromising security, they will stand to gain a significant competitive advantage.

To improve delivery and operations experience, organizations must create the right CI-CD pipelines, providing rapid product delivery to customers. But building CI-CD platforms, then maintaining and managing them, while keeping teams up to speed, is not a trivial task. It requires a great deal of time and effort to continuously evolve platforms to be in step with the rapidly changing technology landscape. In so doing, it is vital to respond to the dynamic needs of various core teams.

As stated by Dr. Nicole Forsgren in the book Accelerate[3], the ability to minimize lead time (from idea to value) and increase deployment frequency are correlated with high-performing organizations. Now, more than ever, the CI-CD platform plays a critical role for such teams.

---

[1] DORA - State of DevOps 2019: https://cloud.google.com/devops/state-of-devops/ - accessed in Dec 2020, this is the latest report from Google. DevOps report for 2020 is not yet released.

[2] Dzone Trend Report 2020: The State of CI/CD: https://dzone.com/trendreports/the-state-of-cicd - accessed in Jan 2021

[3] Accelerate by NICOLE FORSGREN, JEZ HUMBLE, GENE KIM – accessed in Dec 2020

Finding the right alchemy

A generic framework for CI-CD has been designed, based on experience gathered from various implementations across CSP clients. This framework can be easily customized to fit any CSP, dependent upon the needs of their core teams.

At a minimum, the following objectives should be met by any CI-CD platform solution:

- The CI-CD platform should empower teams.

- It should enable faster innovation and rapid team development.

- It must support global alignment to the organization's strategy, value streams and roadmap.

- It should provide balance, so that CI-CD will not become a bottleneck, preventing teams from achieving what they need to.

- It must enable collaboration and sharing of best practice examples, standards, etc., among teams.

- The CI-CD platform should act as a force multiplier for key teams, helping them focus on core domain functionality. This might include attention to developer and operational experience, ease of use, simplicity of tooling, continuous evolution, and richness of documentation.

- It should treat core teams as internal customers, building the platform as a product or service aimed at the teams themselves.

- The CI-CD platform should be built with key properties in mind, such as being API-led, self-service, declarative and most importantly, built with empathy towards core teams.

This CI-CD framework has two layers (global and local stacks) to empower core teams, while ensuring alignment across the organization. In the below figure, the idea is explained in detail.
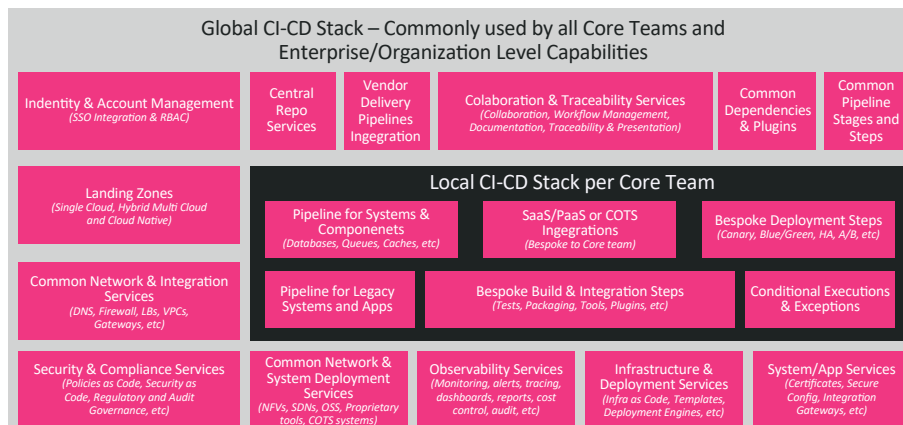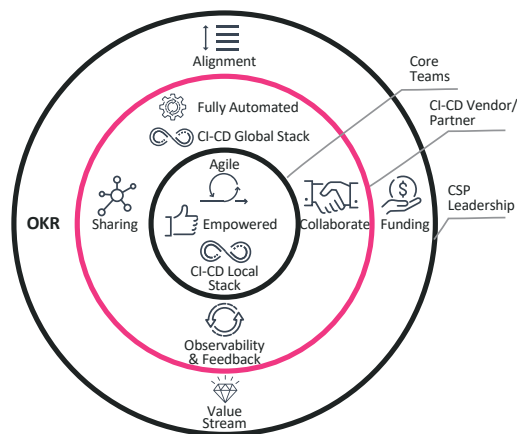

Figure 1: The two-layered (global and local stacks) CI-CD framework

CSPs have various options for directing their IT vendor to build global and local CI-CD stacks, as illustrated below.

	Scope	Responsible	Accountable
Option-1	Global Stack	Vendor/partner	Vendor/partner and CSP leadership
	Local Stack	Core teams	CSP core teams
Option-2	Global Stack	Vendor/partner	Vendor/partner and CSP
	Local Stack	Vendor/partner will onboard, then core teams will own and manage	CSP core teams
Option-3	Global Stack	Vendor/partner + CSP members	Vendor/partner + core members and CSP leadership
	Local Stack	Core teams	CSP core teams

CI-CD Blueprint for BSS/OSS/NFVs

In line with the above framework, CSPs can direct their IT Vendor to deliver a CI-CD platform solution using the following blueprint. This can be done either as a hosted service or as an in-house platform capability, dependent upon the organization's requirements. The idea is represented in the figure below.
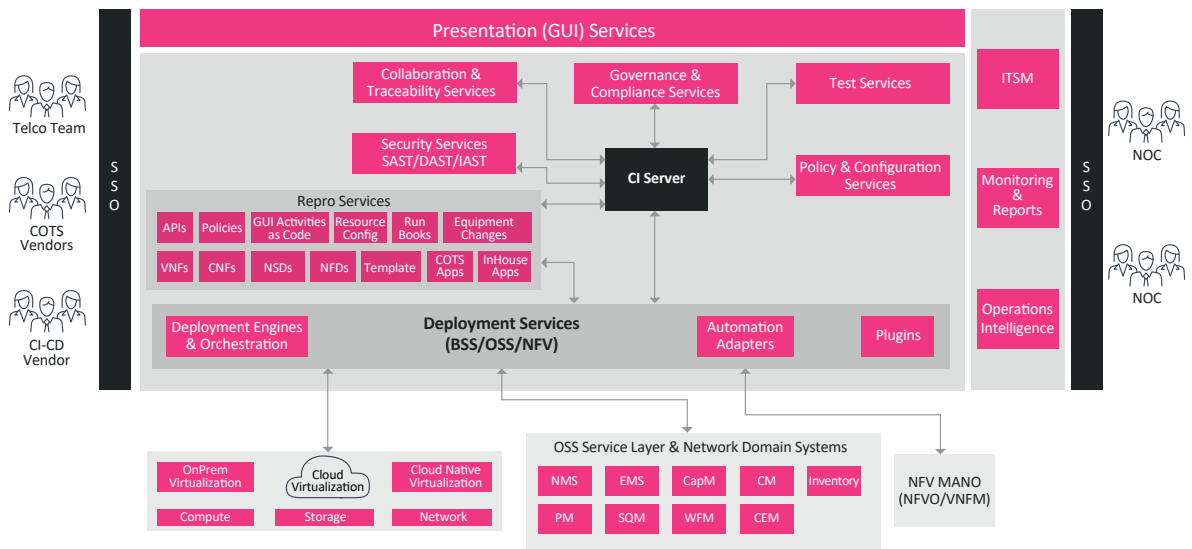

Figure 2: The blueprint for a CI-CD platform

The importance of a CI-CD platform

A UK-based CSP created a CI-CD solution using a virtual floating team concept. Various core team members were borrowed for a few weeks, without a dedicated allocation of budget, time, or resources. Predictably, the organization didn't manage to successfully build an effective platform which core teams could use, even after two years of waiting.

Tata Consultancy Services

Similarly, many CSP clients in Europe and North America have tried to manage DevOps automation as a side hustle, without success. This tends to create chaos and negatively impacts core teams. Instead, CSPs should ask their IT vendors for help, building a feeling of community and shared responsibility across diverse teams.

In Ultimate Advice by Gene Kim, author of The Phoenix Project and Accelerate, he explains the business justification for why companies move to an external provider – it's found in the conflict between **core** and **context**. As Kim says, "Core are the core competencies as the organization creates lasting durable business advantages, and customers are willing to pay for it. And then, context is everything else."

As psychologist John Sweller[4] suggests, CSPs should reduce intrinsic or extraneous cognitive load (contextual work such as building CI-CD platforms) for core teams. This leaves space for germane cognitive load (value-added work for business customers and end-users) so that CSPs can become agile and enjoy a competitive advantage.

As per The 2020 State of DevOps Survey Report[5], evolved and elite organizations offer CI-CD as a standard capability of their core teams. It is important to treat CI-CD platform as a product and thus allocate resources, time, a permanent team and have management buy-in to achieve success. Researchers found that 63% of survey respondents used at least one CI-CD platform, with 60% using between two and four platforms.

Conclusion

In today's fast moving, technology-driven world, organizations face huge challenges to deliver enhanced services, products, and experiences rapidly to their customers, while remaining competitive. These objectives are ambitious and many CSPs face risks and threats when delivering and operating their networks, services, and applications. Agility is required when adopting new architectures, technology, tools, and modern methods of working.

CTOs, CIOs, and the executive management of companies should consider developing a CI-CD platform not as a negligible thing or a side hustle. If not done well, with appropriate effort and time invested, it may impact the overall organization's productivity, causing a knock-on effect on core business goals. Therefore, it is of the utmost importance that CSPs innovate new ways of managing their resources, teams, and funding effectively.

CSPs should strike the right balance between improving delivery and operations experiences and developing their customer experience in innovative directions. To do so, CSPs should adopt new strategies by leveraging their IT vendors and partners to deliver contextual capabilities.

They may do so either via an *out of the box as a service* model or by building a *customized in-house capability*, whichever route best suits the organization.

[4] *Organization Dynamics with Team Topologies by Matthew Skelton and Manuel Pais: https://teamtopologies.com/ - accessed in Mar 2021*

[5] *State of DevOps Report 2021 from Puppet - https://puppet.com/resources/report/2020-state-of-devops-report/ - accessed in Mar 2021*

About the author

Raghu Ram Meda

Raghu Ram Meda is an enterprise architect and domain consultant with the Communications, Media and Information Services group at TCS. With 16 years of experience, he is an expert on domains such as IPTV, OTT, OSS and BSS. Raghu is a digital transformation champion and has partnered several clients on their transformation journeys. He has published articles, white papers and case studies on TM Forum and other platforms.

Contact

Visit the https://www.tcs.com/communication-media-technology page on https://www.tcs.com

Email: global.cmi@tcs.com

About Tata Consultancy Services Ltd (TCS)

Tata Consultancy Services is a purpose-led transformation partner to many of the world's largest businesses. For more than 50 years, it has been collaborating with clients and communities to build a greater future through innovation and collective knowledge. TCS offers an integrated portfolio of cognitive powered business, technology, and engineering services and solutions. The company's 488,000 consultants in 46 countries help empower individuals, enterprises, and societies to build on belief.

Visit **www.tcs.com** and follow TCS news **@TCS_News**.